Monitoring and Control Systems (MCS)

- ⊠ Information Resources
- ⊠ Control Room Layout
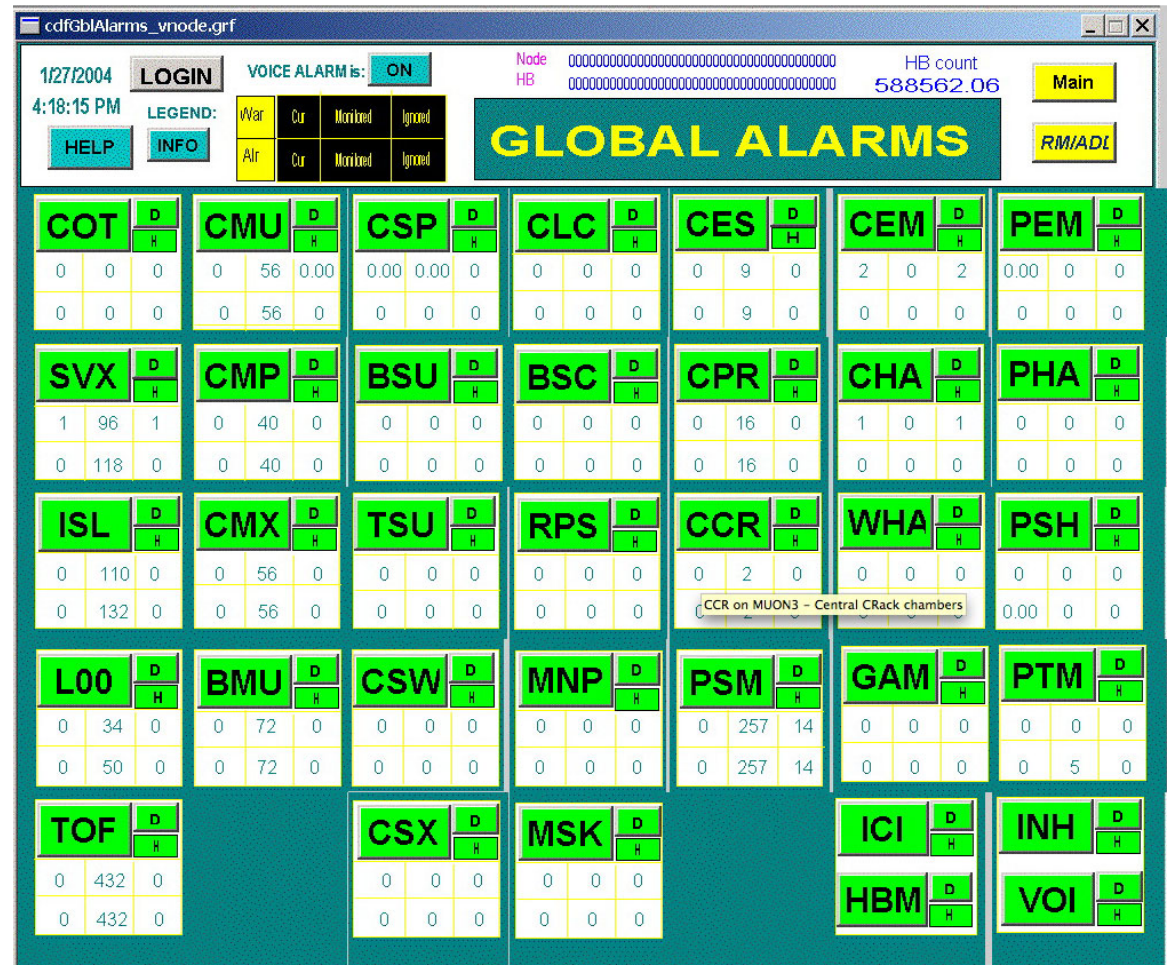- ⊠ iFIX Overview
- ⊠ Basic iFIX Operations
- ⊠ Monitoring Ace Responsibilities

MCS: Information Resources

☒ "iFIX, Detectors info/Recovery" link on Monitoring Ace Help page

➤ Links to MCS homepage and tutorials

➤ Online displays of iFIX "pictures"

➤ Documentation for each detector sub-system:

➔ Tutorials

➔ Shift instructions

➔ Recovery procedures

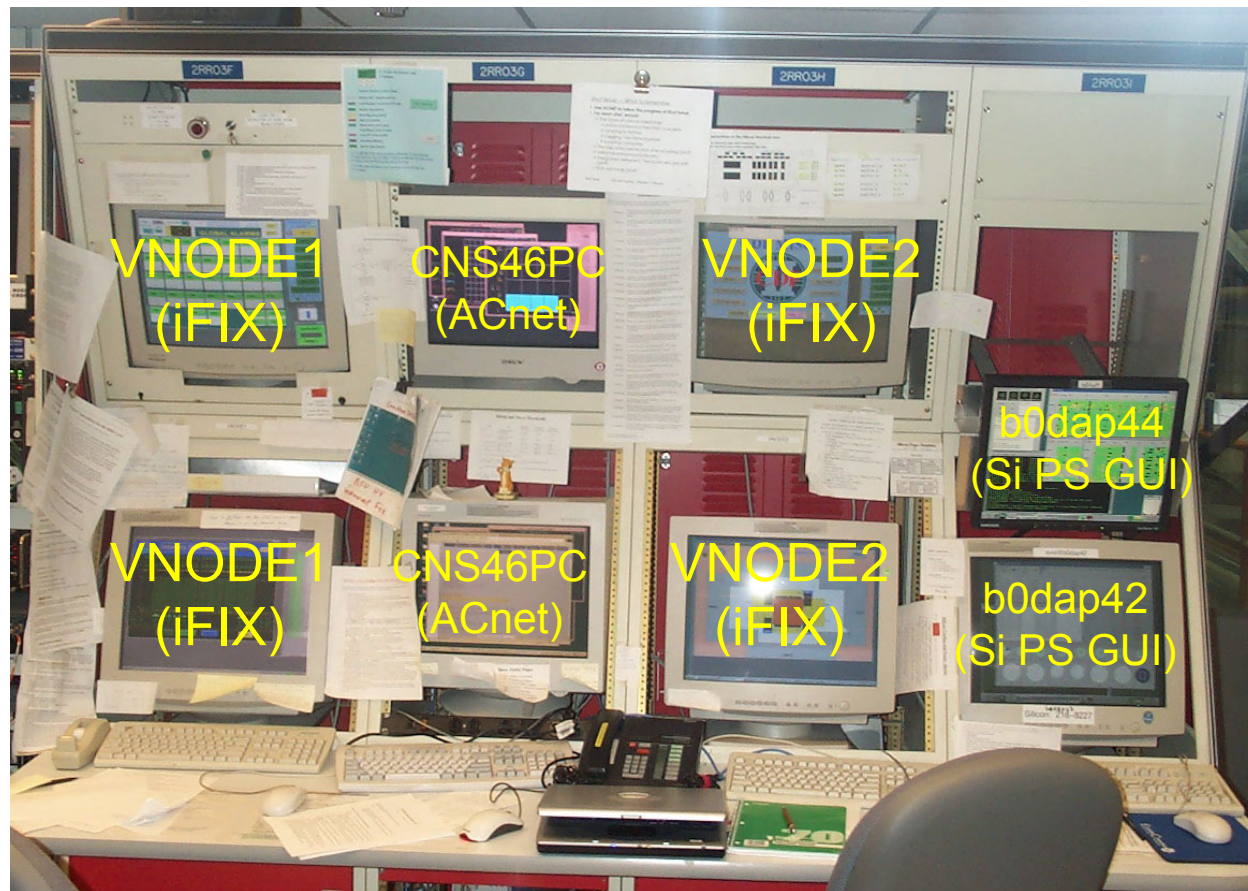

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MCS: Control Room (West wall)

- ⊠ VNODE1 (Ace iFIX PC)
  - ➤ Global alarms
  - ➤ HV summary
  - ➤ Voice alarms
- ⊠ CNS46 (Ace Acnet PC)
  - ➤ Beam losses
  - ➤ Luminosity
  - ➤ Downtime logger
- ⊠ VNODE2 (Public iFIX PC)
  - ➤ General monitoring
  - ➤ Silicon interlocks
- ⊠ Silicon PS GUI (Silicon Linux)
  - ➤ Power supply monitoring & control

MCS: Control Room (South wall)

- ☒ Safety displays
  - ➤ VESDA
  - ➤ FENWAL
  - ➤ FIRUS
  - ➤ Cameras and PELCO controller
  - ➤ Solenoid panel
  - ➤ Silicon cooling panel
- ☒ SOLENOID2 (iFIX)
  - ➤ Solenoid view node
  - ➤ ICICLE program
- ☒ CNS51PC (Public ACnet PC)
  - ➤ General use
- ☒ COT2 (iFIX)
 - ➤ COT HV/current view node
- ☒ b0dap01 (Linux)
  - ➤ Operations

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MCS: iFIX Overview

⊠ iFIX (by Intellution bought by INS bought by Emerson bought by GE FANUC)

> ➤ Networked system of PCs running iFIX software and using hardware interfaces to sensors, controllers, and APACS PLCs
>
> ➤ Presents HUI (OK, GUI) to control and monitor systems

⊠ Makes possible:

> ➤ Monitoring and control of detector and infrastructure systems
>
> ➤ Basic control during data-taking
>
> ➤ Expert control and logging at system PCs
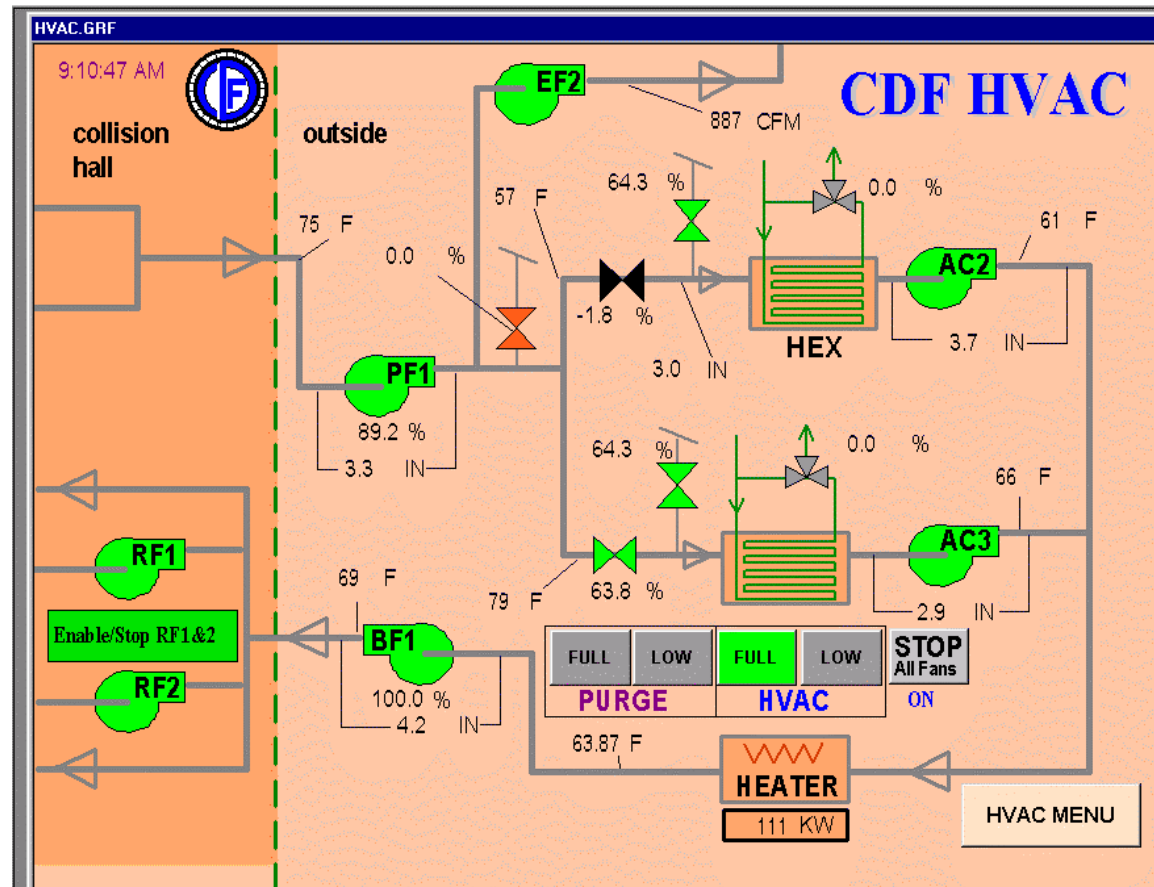
Example iFIX "picture" (collision hall HVAC)

MCS: iFIX Overview

- ☒ iFIX "pictures" have links (usually, as buttons) to other "pictures". Any CDF symbols link to the main iFIX page:
- ☒ Main iFIX "picture"
  - ➤ Shows process system tech currently on duty and their LRP #
  - ➤ Displays iFIX status
    - ➔ Server should be ON
    - ➔ Server disk should be S:DRIVE not a local disk such as C:
- ☒ iFIX accounts (<u>not</u> Windows account):
  - ➤ VNODE1: always ACE (learn password), some privs like reset power supplies
  - ➤ VNODE2: always PUBLIC (no password), for general use (no privs)
- ☒ All iFIX "pictures" run within Intellution Dynamics Workspace window
  - ➤ Can be restarted from START→Programs →iFIX →Intellution Dynamics Workspace
  - ➤ Cannot shutdown iFIX or log out without privileged iFIX account (<u>not</u> ACE)
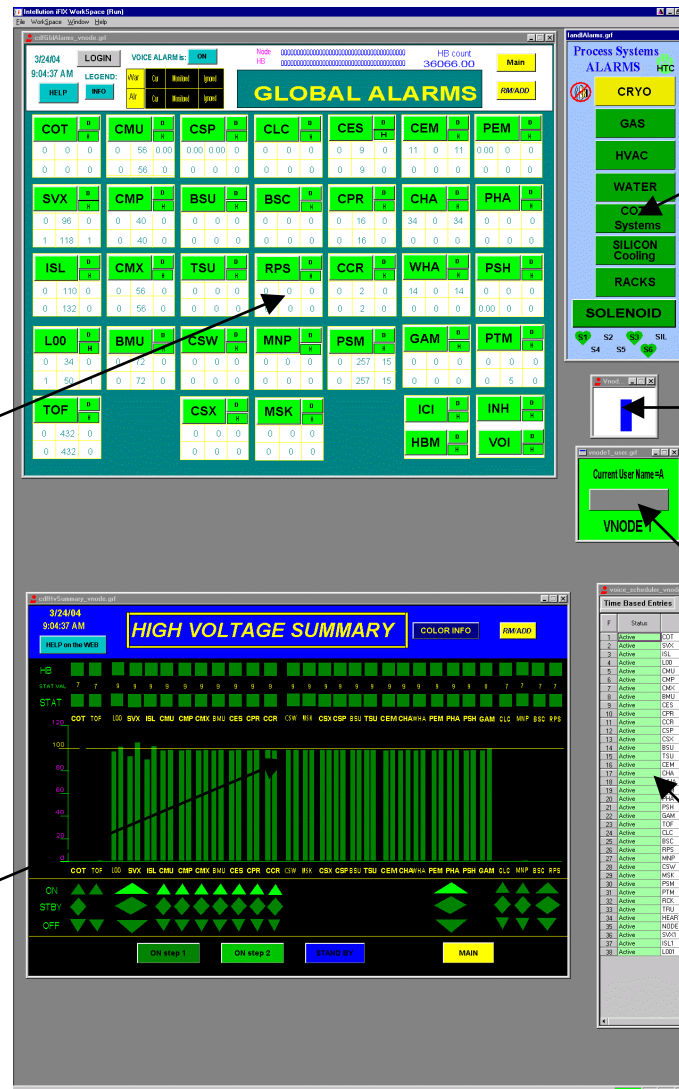

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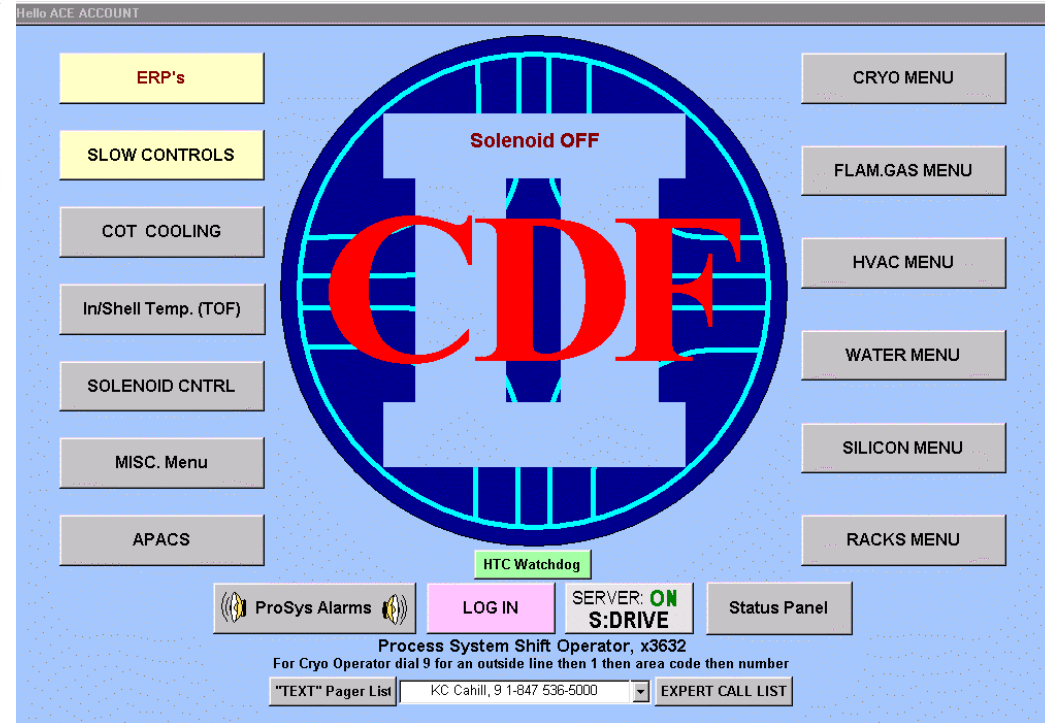
MCS: Basic iFIX Operations

Following "pictures" should <u>always</u> be on VNODE1:

Global Alarms: box red (alarm) or yellow (warning) needs investigation

HV Summary: any bar red (alarm) or yellow (warning) or far from 100% when green needs investigation

Process Systems Alarms: ERP and other important systems show up in red (alarm) or yellow (silenced)

Pinwheel: spins when iFIX is ready for input

Login check: turns red if iFIX account is not correct (ace)

Voice scheduler: looks for conditions and produces audible alarms. Do <u>not</u> close!
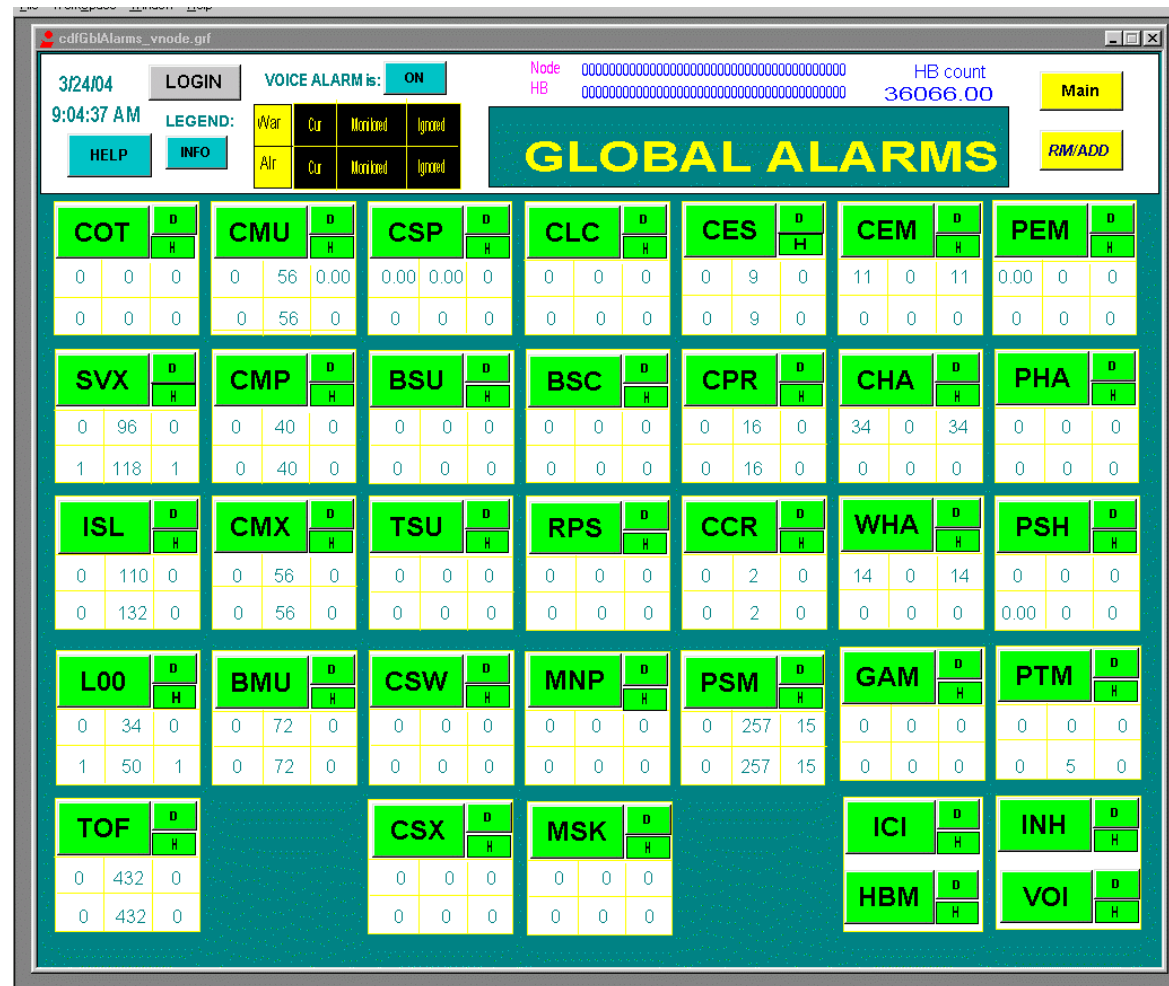
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MCS: Basic iFIX Operations

✉ Global Alarms "picture" summarizes status of detector and power systems

- ➤ Matrix of current, monitored, and ignored warnings and alarms
- ➤ Click on system name to get error history
- ➤ Click on adjacent <u>D</u> button to get detailed information
- ➤ Adjacent <u>H</u> shows heartbeat status (is system PC responding?)
- ➤ See legend <u>INFO</u> button for details on colors

MCS: Basic iFIX Operations

✉ High Voltage Summary "picture" displays and control HV status for each detector

- ➤ HB row shows heartbeat status (bad—purple)
- ➤ STAT row shows status (green-on, blue-standby, red-tripped)
- ➤ Double bar histogram shows min & max channel for detector in % of correct value
- ➤ Arrows at bottom turn HV on, off, or standby
- ➤ Buttons at bottom allow ON during shot setup, ON for data-taking, and STANDBY for all detectors
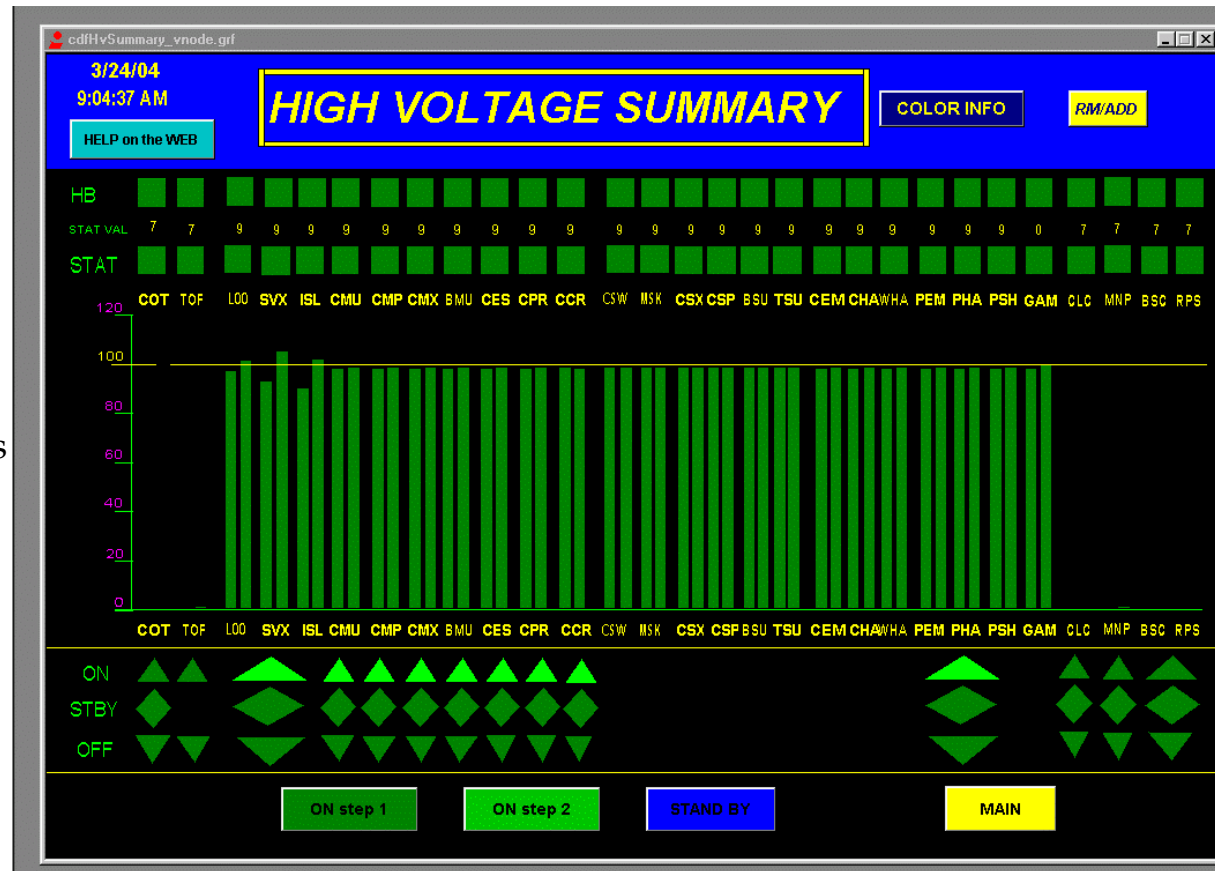
MCS: Basic iFIX Operations

- ☒ Process Systems Alarms "picture" summarizes alarm status of important systems
  - ➤ Global button for each system brings up "picture" containing list of all devices which may cause alarm in that system (alarm-red, silenced alarm-yellow and "no sound" symbol)
  - ➤ Device(s) in alarm show up in red instead of green (silenced will also be indicated)
  - ➤ Heartbeat indicators for cryo area computers at bottom
- ☒ If there is an audible alarm (even if silenced):
  - ➤ Call the cryo tech (X3632) to confirm and find out action being taken
  - ➤ Click button to determine device in alarm

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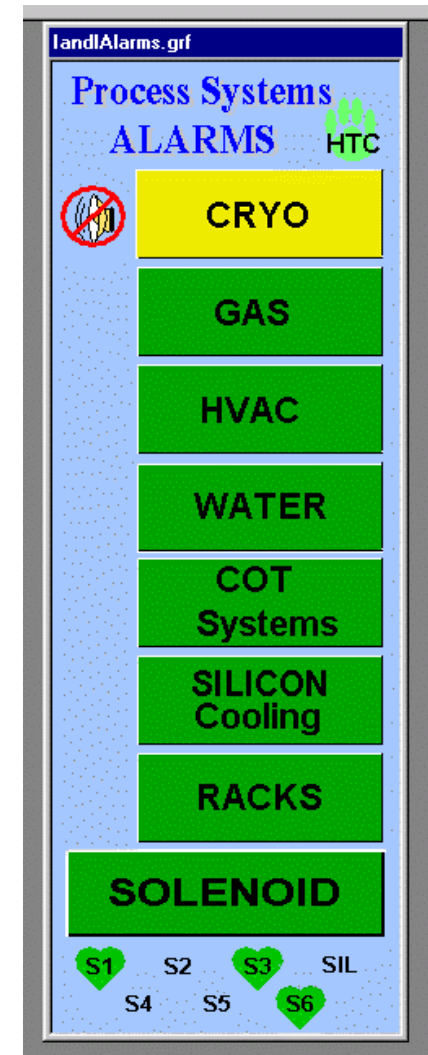
- ☒ Understand all alarm conditions at beginning of shift (consult with previous monitoring ace) and write list in e-log
- ☒ Monitor safety systems—FIRUS, VESDA, status panel (please read "Monitoring Ace Knowledge")
- ☒ Make sure voltages are in correct state (shot setup checklist):
  - ➤ During shot setup
  - ➤ In preparation for data-taking after scraping
  - ➤ In preparation for end of shot or after beam abort
- ☒ If HV trip occurs (red HV summary bars):
  - ➤ Click global button to get history of alarms
  - ➤ Click adjacent D button to get detailed picture of detector and note in e-log specific location(s) of trips
  - ➤ Follow specific MCS help instructions for tripped detector; for most systems, at least once, reset HV by clicking ON arrow on HV summary "picture"
  - ➤ Make sure trigger inhibit works correctly

☒ Check process system alarms with process system tech
  ➤ If not understood, may be cause for initiating ERP

☒ If system shows lost or no heartbeat (adjacent H button grey or purple), notify system expert(s)

☒ iFIX problems on VNODE1 or VNODE2:
  ➤ If VNODE1 not logged in as ace, login check will turn red. Click on grey button and log out of wrong iFIX account and back in as "ace".
  ➤ If unresponsive or frozen, call iFIX experts:
    ➔ J.C. Yun
    ➔ Steve Hahn
  ➤ Under expert advice, may have to reboot computer by power cycling

☒ Problems on detector PC may require local actions at that PC

☒ If ICICLE does not send data to runControl, may need to restart on SOLENOID2

☒ iFIX crashes are tricky and often not reproducible; the more info written in the e-log, the better